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# Europe Report

## SCIENCE AND TECHNOLOGY



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# EUROPE REPORT

## SCIENCE AND TECHNOLOGY

### WEST EUROPE

EAST EUROPE



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# EUROPEAN BIOTECHNOLOGY RESEARCH PROGRAMS OUTLINED

Venice IL GAZZETTINO in Italian 30 Jul 86 p 9

[Text] 400 billion lire a year in Great Britain; 118 billion a year, plus another 670 in the next 5 years, in West Germany; 100 billion a year in France; 27 billion in 3 years in Spain; and 40 billion in 6 years in the Netherlands: These are the government allocations for biotechnological research in the major European countries.

These figures were obtained from the first report of the National Biotechnology Committee of the Ministry for Scientific and Technological Research, which was presented in Rome on the occasion of the launching of the national research program in this sector. The program forsees expenditures of 1 trillion lire in 5 years. The report highlights the fact that public research programs are similar in value in terms of the gross national products of the various countries, and that in all cases the emphasis is put on personnel training.

Great Britain -- The government's basic philosophy is to maintain continuous dialogue with industry, which is the repository of production and market knowhow. Various national agencies in the sector finance research programs on the basis of quality of the research proposed and not on its potential applications. Britain estimates that in the next 10 years about 1,000 biotechnicians will have to be trained in the country.

West Germany -- Government action is in the hands of the Ministry for Research and Technology and consists of direct financial support to research centers and industries. In 1986, this financial support is 2.4 percent of the ministry's total budget, a 30 percent increase compared to 1985. This year a 5-year program aimed especially at industrial innovation was launched.

France--Priority is given to industrial research. In 1982, a program was launched to mobilize biotechnology with the objective of achieving French control of 10 percent of the world market by 1990. In addition to direct financing, mutual investment funds were set up to create new financial companies committed to biotechnology.

Spain--In 1983 a 3-year plan was launched which, among other objectives, proposed the creation of a National Genetic Engineering and Biotechnology Center. It also has the task of coordinating with universities and research centers oriented toward innovation. The strategy is based on the selection of a limited number of priority areas of interest.

8626
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## TECHNICAL CONSIDERATIONS, STRATEGY OF AIRBUS DEVELOPMENT

Rome AVIAZIONE in Italian Apr 86 pp 177-179

[Text] After years of talks, of plans and projects about the "future" 150-seat aircraft, the list of contenders is being defined; as a matter of fact, there is a recent agreement between Boeing and a consortium of Japanese, Swedish and British companies to implement the Boeing 7J7 project. Thus, it is hoped, that with the final offer by the third and last bidder, there will come to the fore the race to corner the market for the aircraft that will replace the short and medium range jets of the middle '60s.

McDonnell Douglas joined the race with its MD-80 series whose MD-88 and MD-91 versions seem to offer the best possibilities from the point of view of improved performance in economy of management and operation thanks to the propfan system that will characterize them. In any case, the success of the other models of the series is noteworthy, together the MD-81, -82, -83 and -87, with 283 units sold through March, have already cornered a significant portion of the market.

Of interest, on the other hand, is the success of the most conventional design in the same category, the A320 of Airbus Industries, with definite orders for 119 units and 144 more tentative ones between options and intentions to purchase, all of this considerably prior to the prototype's test flight. The A320 design was truly the result of Airbus' decision not to develop a propfan-propelled aircraft, but instead to use "normal" turbofans of high dilution rate.

Let us try to outline Airbus' strategy, which places it on a totally different level from the point of view of technological and operational choices until the year 2000. It is undeniable that a company that manufactures technologically advanced equipment must define its priorities in matters of choice ahead of time. "The use of modern techniques and innovations can be very costly and the question 'whether' the resulting product justifies the effort in terms of profits is equally essential to the aircraft manufacturer and to the operator." This was the opinion of D. Little, vice president for development of new products and advanced technology of Airbus Industries, expressed at a conference on the subject of the application of advanced technology on future commercial aircraft. Airbus has gone all out on the certainty of being able to use certain materials profitably, while eliminating others that were perhaps more technologically advanced as well as on the capability of putting the aircraft into service within a relatively short time, without, however, giving up the manufacturing of an aircraft of unquestionably advanced design as compared to the aircraft it is going to replace.

Actually, the European group rejected the propfan for a number of reasons: there was no chance of its becoming operational prior to 1992; to avoid development problems of airframe coupling; new engines; advanced avionics and eventual flight control by means of fly-by-wire systems, to the point that in 1980 Airbus had already decided to cancel its own project for a propfan aircraft in order to replace it with the present A320. According to Airbus, the A320 features a series of technological innovations such as the previously mentioned flight control with fly-by-wire systems, improved wing aerodynamics, the use of composite materials, the FADEC (Full Authority Digital Electronic Engine Control), a most advanced cockpit, an automated maintenance system and finally, the V2500 or CFM56-5 engines that will make it a very profitable aircraft for the airlines by 1989 when it will begin operating until the year 2010.

Propulsion Systems

The usual Airbus policy, described by its own management as a "cross-pollination" from one project to another, was evidenced, particularly when it came to the reasoning behind the choice of the turbofan engine over the propfan. The engines that will initially power the aircraft are the IAE V2500 and the CFM International CFM56-5, whose design will remain constant for a certain period of time; however, the consortium expects advances to be made in the design of the engine nacelles, in the noise abatement and from the FADEC, which will reduce the present system's weight by more than 100 kg and, therefore, reduce fuel consumption, in addition to the pilots' workload and maintenance costs.

As far as the propfan is concerned, let us see what the various performance capabilities are of these engines that caused Airbus to decide to continue designing aircraft with turbofan engines. The first problem to solve in the design of an aircraft equipped with such an engine, a matter that is still open to question, is the one regarding the General Electric design of a gearless unducted fan, whether wing mounting is preferable, either with single or counter-rotating blades, because the noise in the cabin could be a serious problem in addition to other problems caused by structural fatigue due to vibration. To diminish the noise in the cabin, the ideal solution would be a rear fuselage mounting, but this moves the fan into the most unfavorable flow area because of the interference between the wing flow, fuselage interference and the exhaust effects of the engine nacelles. In addition, the propfan is prone to water suction and FOD [Foreign Object Damage].

Furthermore, there is concern at Airbus Industries about the structural soundness and resistance of the blades in the event of impact with birds or other foreign objects.

As far as the noise is concerned, at present, compliance with FAR regulation 36, third stage, or with ICAO, Attachment 16, Chapter 3, which will become effective in the years between 1990 and 2000, is still far off.

Nine years after the first tests on the propfan began there is a number of unanswered questions, too many, according to Airbus, to justify the decision of an industry to launch a new aircraft that must provide foreseeable time schedules and maximum safety conditions, at least equal to present-day aircraft.

The American manufacturers, who follow the propfan development with confidence, especially of the joint Pratt and Whitney-Allison 578-DX design that is to be flight-tested in 1987 on an MD-80 test bed, are of a different opinion.

It must be borne in mind, however, that these are a series of initiatives that have not yet been well defined; therefore, none of the fuselage manufacturers, nor those of engines, have made definitive choices.

Airbus believes that engines characterized as "ducted prop" and "contra fan"--that have a wider fan, but conventional engine nacelles--have better chances because this makes their mounting easier as well as offering the possibility to mounting them as retrofitting on present-day aircraft.

Structural Aspects

An aircraft's fuselage must also be developed to the utmost to be atuned to the design and the purposes to be attained by the manufacturing company. Consequently, it must strive to attain an excellent MEW-TOW coefficient or MWE relation per seat. Consequently, an airframe as well must be easy to maintain, to inspect, to repair, in addition to being easy and functional to modify. Modifications could become possible because of operational demands in addition to adding value in the eventual sale of the aircraft. The A 320 has been designed according to the FAR 25 requirements up to amendment 54, which means that the aircraft is approximately one metric ton heavier than it would be had it been designed in accordance with the preceding requirements. This suggests that it is not always sought to build the lightest possible structure nor is this ultralight structure always the most economically feasible.

Much is being spent today on research of the lithium alloys that were initially used around the '50s, but, despite the fact that they showed an excellent characteristic of lightness, they were unsuitable in case of cracking. Recent studies indicate that it might have been possible to eliminate somewhere between 900 to 1,000 kg of weight in an aircraft of approximately 55-60 tons [metric] and up to 5,000 kg per aircraft of the B-747 type, as of 1985. However, these alloys have not proved as successful as had been hoped and, at present, only 25 kg of weight have been eliminated from each A 320 wing by using 250 kg of aluminum-lithium alloy in their non-supporting structure. Nevertheless, an increased use of the amount of aluminum-lithium alloy is foreseen for all future Airbus projects and for the updating of the present ones. On the other hand, the use of these materials on a large scale could engender an unprofitable price increase because of their cost.

Moving on to composite materials, they present a problem because of the high prices of the materials; however, thanks to the low manufacturing costs, they have proved to be very profitable and, as a matter of fact, should prove to be more so in the future. For instance, the carbon fiber-made parts designed for the tail assembly of the A 310-300 number 96, as compared to 2,072 for similar tail assemblies of the A 300 made of metal. Thus, not only is there a 140 kg -weight reduction, but the overall cost in materials and machining of the parts is also considerably lower. Advanced thermohardeners and thermoplastics are the composite materials aimed for in the future; however, their price, which is three and one-half times higher than the current ones, will slow down their use in civil aviation.

Flight Control Systems

The decision to use a fly-by-wire control system on the A 320 allows a weight reduction of 136 kg and, consequently, the adoption of push-pull control rods additionally reduces weight by 56 kg as well as improving cockpit visibility for the pilots, not to mention the improvements because of easier maintenance.

The introduction of optical fibers would have a great attraction in the near future for aerospace industries; however, their durability capabilities, under normal operating and maintenance conditions, have not been sufficiently tested.

Of interest would be the adoption of power-by-wire or electro-hydraulic actuators, which, on the other hand, had already been used in the RAF V bombers in the '50s and in the VC-10 afterwards, without, however, really improving their performance. There would be no weight reduction in this case, actually, there might even be an increase in weight due to the installation of emergency electrical generators. Because of this, the dream of an "electric" aircraft, many times beheld and considered as being very close to becoming a reality, has, for the time being, remained just that. If indeed it becomes a reality, it would afford greater savings, but it would undoubtedly require more time before it comes into being, moreover, because a series of problems, such as air conditioning, engine starters, the type of electrical power used, etc.

Avionics and Instrumentation

Undoubtedly this is one of the fields wherein the most progress was made in comparison to the aircraft that the present 150-seater is to replace. As regards the A 320, as well as the competing aircraft, the data shown on the CRT [Cathode Ray Tube] include altitude, course, vertical speed, in addition to the primary information on the engines, shown on the ECAM [Electronic Centralized Aircraft Monitoring System] screen where the data are displayed with synoptic system ideograms. The reduction in size of the various "black boxes" was one of the most successful achievements in the changes that have taken place since the analog technology of second generation transport aircraft to the present digital one of the A 310 and B 767-type aircraft.

The adoption of the fly-by-wire system in the A 320 eliminates the need for servomechanisms for the auto-pilots and, consequently, the AFS [Automatic Fligh System] is considerably simplified. To return to the cockpit, an increased use of electronic flight instruments has brought about considerable simplification of the screens.

A direct part of this is the CFDS malfunction display system that was jointly researched by the firms purchasing the aircraft and will afford significant improvements in maintenance procedures. The CFDS system of the A 320 provides airline company maintenance personnel with a centralized inspection service of the electronic equipment of the aircraft and those systems that are electronically controlled. Two MCDU [Malfunction CRT Display Unit] screens for multifunction controls in the cockpit enable the maintenance technician to check the malfunctions entered in the log by the flight crew, to identify the units to be replaced and to perform any eventual tests needed after the replacement.

Finally, according to Airbus Industries, no revolutionary development in the next generation of transport aircraft is going to take place in the near future. This is true for the engines, the systems and the materials. Undoubtedly there will be improvements in fuel consumption, but, in order to obtain substantial improvements, it will be necessary to make investments on such a scale that the operation would be uneconomical.

The larger part of improvements to be had in the years to come could undoubtedly be applied both to the A 320 and to the other aircraft of its class that are also competing with it to establish a reputation in the skies of the world.

Fuel economy will not be the theme of the future on the drawing boards of the manufacturing companies. Instead, more funds will be proportionately earmarked for research to reduce purchase and maintenance costs, an operation that is at a very advanced stage at Airbus. Every completely new aircraft will have to compete with the improved versions of the latest, most advanced designs of our times.

This is a criterion that proves its validity and can be tangibly applied to the various versions of the MD-80 family, to the wide-body Airbus and to the B 747, as well. However, as we have seen, the industry choices differ on this point: McDonnell Douglas will renew its inventory with propfan engines; Boeing is actually planning a new aircraft having been especially researched to be equipped with this type of engine and expects to update its B 747s by equipping them with the even less proven ductprop engine. Airbus still believes in the turbofans and will use the latest, most updated versions, both on the wide-body aircraft and on the new A 320. As we have seen, it gambles on other factors to make its designs "advanced." The difficult verdict is up to posterity.

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## FIAT AVIATION COLLABORATION IN ENGINE PRODUCTION OUTLINED

Rome IL POPOLO in Italian 31 Jul 86 p 9

[Excerpts] In the field of civil transport Fiat Aviation is participating in advanced programs through a series of international cooperation agreements.

Together with the American firm Pratt & Whitney, a leader in the field of double flux turboreactors (turbofan) with which airliners are equipped, and the German firm, MTU, Fiat Aviation is participating in the production of the new PW-2037 engine. It is a turbofan engine which develops a 37,000-pound thrust and is mounted on the latest Boeing 757. A major characteristic of this engine is very moderate fuel consumption. In particular, Fiat Aviation has designed and produces the gear box with its transmission and oil tank.

With Pratt & Whitney, Fiat Aviation also is contributing to the development of the larger PW-4000, intended for the latest version of the Jumbo, the Airbus A-300, and the Boeing 767. Fiat Aviation is also a partner of General Electric in the CF6-80 turbofan program, still another new and very powerful engine for large civil aircraft.

Fiat Aviation is also working on another new engine, the V2500. This engine is one of the more prominent examples of international cooperation. It will be manufactured by Aero Engines International, a joint venture made up of the most prestigious builders of aircraft engines: Pratt & Whitney, Rolls Royce, Japanese Aero Engines Corporation, MTU, and Fiat Aviation--five leading companies from five different countries representing the most advanced technology.

The V2500 is a turbofan engine intended for the new 150-seat commercial aircraft. These airplanes (Airbus A-230, Boeing 767 and Douglas MD-89) will replace hundreds of CD-9's and Boeing 737's currently in service. Thus, the market for this engine is quite large.

In addition to the turbofans for the airliners of the 1990's (which will be operational well beyond the year 2000), there are gas turbines for ships and industry. Thanks to a cooperation agreement with General Electric, Fiat Aviation is participating in the development and production of the LM-2500 turbine, which is derived from the CF-6 aircraft engine, and has 30,000 horsepower (and is related to the less powerful LM-500). To date, 500 have been sold. Fiat Aviation provides all the features necessary throughout production to adapt the turbofans for marine use.

In this panorama of Fiat Aviation's main activities, a prominent place is occupied by the design and production of gear boxes and reduction gears for helicopters. It is a technically complex production in which Fiat Aviation has gained considerable experience.

In fact, in Fiat Aviation's plants in Turin and Brindisi the most advanced technology is now used: electron beam welding, laser welding, heat treatment in controlled atmosphere furnaces, electrochemical machining of superalloys, just to mention a few.

The laboratories for mechanical and fluid dynamic tests and the engine test rooms deserve particular mention. The plants at Sangone (Turin) have seven soundproof rooms equipped with electronic measurement systems and data processing systems for turboreactor inspection.

Even the plant in Brindisi has engine testing equipment. Recently a new testing room was set up to test jet engines having up to 50,000 pounds of thrust. In addition there soon will be another scale testing cell to test engines of 100,000 pounds of thrust. As a result, Fiat Aviation in Brindisi will have reached a very advanced stage on a worldwide level.

All the work is carried out with precise methodology: The materials used, highly sophisticated and difficult to handle; the permissible tolerance limits, in the range of a hundredth or a thousandth of a millimeter; and the complex geometry of certain features require constant attention.

To ensure product quality Fiat Aviation uses refined technologies: electronic scanning microscopes, x-rays, ultrasound, ultraviolet photometry with penetrant liquids, and magnetic controls.

These are the same analysis methods used during engine overhauls, another important activity. In fact, every aircraft engine is subject to periodic overhauling during which it is completely dismantled to allow a careful examination of every part and to check for signs of deterioration. During these operations, all parts close to life expectancy limits are replaced and then the engine is reassembled and carefully tested in the test room.

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## AERITALIA CIVIL AVIATION PROGRAM DISCUSSED

Rome AVIAZIONE in Italian Apr 86 pp 205-206

[Text] Aeritalia's GVT [Transport Aircraft Group] is responsible for transport aircraft, both commercial and military, and, in this context, if the expectations for actual production of the ATR 42 are great, then, a significant role for capturing part of the market in the future in this area is represented by the operations to introduce innovations in manufacturing and modernizing the G 222. This aircraft has shown, with a long series of models sold in many non-European countries, the soundness of its design as the support aircraft of the larger, but aging C 130. Therefore, Aeritalia, having taken into account the availability of markets, has set up a program, which, initially applied to aircraft being used by military aviation, will be expanded to all aircraft already built and to be built, thus making the aircraft operationally viable until the year 2000 and beyond.

The GVT also handles civil aviation projects that have reached a significant expansion accrual. As a matter of fact, according to Mr Caporaletti, if the joint production program of the B 767 and B 757 continues at a reduced rate--no more than two aircraft are completed monthly--the trend of the two-engine aircraft market should be on the increase with the use of the B 767 Extended Range on the trans-Atlantic routes as well.

However, it appears that the above-mentioned prospect is rather complex and fraught with difficulties, judging from the figures that the airlines interested in the introduction of this aircraft in this specific area can produce to uphold the soundness of this design.

As a matter of fact, beyond the outstanding prospects touted by Boeing in the process of the project's launching, the Extended Range does not indicate that it has yet been able to overcome the difficulties of name recognition and psychological impact on the international regulatory agencies. This has prompted the ICAO and the FAA to use extreme caution in issuing new regulations. Nevertheless, the marketing plan for the B 767 and B 757 cannot depend solely on the introduction of some trans-Atlantic routes.

On the other hand, the collaboration between Aeritalia and Aerospatiale has produced different results: the ATR 42, which, according to data supplied by Aeritalia, will reach the "break-even" point with the delivery of the 35th unit, has, 6 months after certification, received more than 100 orders, and the first of ten fuselages has been sent to Toulouse for final assembly of the aircraft purchased by the

Alitalia group. The first aircraft bearing ATI colors will begin scheduled flights in July 1986.

The reasons for optimism within Aeritalia on the ATR development project are due to two principal series of factors: a) the satisfaction of the American market with the European turboprop, despite the presence on the market of the SAAB 340 that was built with the direct participation of Fairchild, a company that is well represented in the American commuter aircraft market; b) the recent Finnair order for ten ATR aircraft of the 72-seat "stretch" model.

This order, even if it might mean additional cost to the manufacturer (a substantial modification such as the addition of 20 seats on a 50-seat aircraft requires radical redesigning) is, nevertheless, a tangible demonstration of the soundness of the design.

As a matter of fact, this order not only involved the airframe designer, but the engine manufacturer as well because the propulsion plant of the ATR 42 could not meet the added demand of thrust. This is considered by Pratt and Whitney to be an additional boost to the turboprop market; therefore, the company has committed itself to produce within an extremely short time a technologically advanced engine with a 2400 HP thrust equipped with an "augmentation thrust rate computer."

The ATR 42, which was conceived as the largest in the commuter aircraft class, not only shows wide acceptance by the carriers, but is in the process of placing itself, with a natural upward trend, into the broader sector of the second level of airline aircraft and to perform a saturation role in the area between the advanced jet aircraft and the smaller turboprops operating in the 20-passenger area.

Production-wise, the ATR 42 represents the most active line of the GVT. Prominent in the area of employment and research are the development projects connected with McDonnell Douglas. As Mr Caporaletti pointed out, Aeritalia has actually become the largest foreign supplier in the production of fuselages of the DC9/MD-80 series whose 1300th fuselage left Naples recently.

Under the new agreements resulting from the reliability of the technology available in its Naples plants, Aeritalia was entrusted by the Long Beach-based company with the manufacturing of the entire dorsal component of the KC-10 fuselage and the carbon-fiber rudder of the same aircraft and that of the MD-80.

In addition, GVT has signed an agreement for research and development of the new medium-range aircraft that McDonnell Douglas proposed to equip with the new UHB engines. These engines, equipped with a counter-rotating propeller pusher system, will require special technological arrangements for their installation on the rear of the fuselage, not only in terms of pylons, but especially in materials, given the high decibel level generated by counter-rotating propellers.

Aeritalia, which some months ago had already sent an important research group to Long Beach, was entrusted with the job of manufacturing the model of the tail assembly on a 1:2 scale for the wind tunnel tests.

In the context of future GVT projects, technologically the UDF will be the most

important project of the nation's aircraft industry because it is expected that the development paths of medium-range air transport, beginning with the '90s, are going to converge on the UDF aircraft.

The introduction of this aircraft, in both the civil and military fields, will surely be made easier by its low operational costs that will allow for considerable fuel economy world-wide.

GVT's projects involving new aircraft would not be complete without the introduction of the P-86 "Mosquito."

The small, two-seater, basic trainer, manufactured by Partenavia, should, according to its designer, Dr Pascale, reattract to Italian private aviation the new blood of amateur fliers, especially the young ones for whom the high costs of aircraft and the lack of governmental action have progressively kept them from flying. Indeed, today it is difficult to conceive how a young student might ask his family for 30 million lire for a second degree pilot's license and at least 200,000 lire for 1 hour's flying time.

The cost spiral has also been the cause of the serious crisis in private aviation in Italy and the reason for a rapid rise in the average age of general aviation pilots. This obstacle could be overcome with the introduction of the Mosquito, which, with an initial cost of about 50 million lire and an extremely low hourly cost because of the minimal fuel consumption involved, will be equipped initially with a 65 HP two-cylinder Lycoming engine that could be replaced, when type-tested, by a 75 HP four-cylinder engine made by the Italian IAME company.

The single-engine plane, presently ready to be tested, was manufactured, as a calculated risk, by Partenavia in accordance with the requirements of both the ICAO and the FAA as a basic trainer aircraft and, therefore, capable of performing certain aerobatic maneuvers and spin entry and recovery.

The aircraft will be type-tested in accordance with regulations 223 of RAI [Italian Aeronautical Register] and 23 of the FAR. It could, with the proper selections by the flying clubs, once more bring the pleasure of flying even to the very young.

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# OVERVIEW OF EC EFFORTS TO PROTECT SOFTWARE

Milan SISTEMI E AUTOMAZIONE in Italian Jun 86 pp 609-610

[Article by Mauro Massara]

[Text] Although sophisticated and inherent in the programs themselves, the purely technical protection devices proved to be ineffective since they are outflanked, as it were, sooner or later. The growing economic importance of software (the relative billing volume for software alone, in other words, including services, was 1,600 billion in Italy in 1985, generated by about 3,000 companies) increased the need for finding a legal standard that would provide protection for this product of human activity.

Among the various possible forms of protection--ranging from patents to the recognition of the market value and all the way to the implementation of procedures against unfair competition--there emerges in the international field (in general) and in the European Economic Community (in particular) an orientation of lawmakers and judges toward the protection of software through the system of authorship rights which is similar to the copyright system, without however excluding the applicability of other complementary forms of legal protection. In this worldwide data processing market, one naturally recognizes the need for amending the domestic and international rules on authorship rights which were not drafted with the problem complex of software in mind, without however modifying the basic principles incorporated in the existing international agreement which already appeared adequate for this purpose. Protecting authorship rights appears applicable to all of the different types of software: From application software (connected to the specific uses of the data-processing machines) to basic software (operating systems, translators, etc.) and all the way to firmware (circuit software), to the videogame programs, as well as to software accessories, put together primarily by documentation and flow charts. The extension of authorship rights would therefore make it possible in a short time to provide legal protection for data-processing machine programs which would be uniform in the chief industrial countries. This delicate but important topic is debated in a book entitled "Software e diritto d'autore" and published by Franco Angeli; it presents the reports and remarks at a conference organized by the CEIIL (European Information and Data Processing Center) in collaboration with IBM Italy. The book illustrates the various type of legal protection for software; it analyzes the orientations and the standards

developed in the most important foreign countries and above all it discusses the problems of extending the discipline of authorship rights to the different categories of software products. Protection for the computer program through the discipline of authorship rights can today be said to have been generally accepted, both in Italy and abroad.

As for Italy, we are particularly looking here at the 15 July 1983 verdict of the Turin court and the important ruling by the Pisa magistrate on 11 April 1984.

Among the current legislative developments within the Community, we might mention the following.

Denmark: Preparing a bill for explicit protection for authorship rights.

Germany: Discussing a bill concentrating on authorship right protection.

The Netherlands: An interdepartmental committee in 1984 came out in favor of specifically mentioning data-processing machine programs in the authorship law. Official approval was given for drafting a new law on this.

Great Britain: Parliament is examining a bill aimed at expressly protecting programs through authorship rights; this bill was approved by the Government and the regulation will therefore probably be adopted soon.

France: Law No. 85-660 took effect on 1 January; it deals with authorship rights and the rights of artists and performers, of the producers of videophonograph works (video recordings, sound recordings) and of the audiovisual communication companies. The law, made up of 66 articles, amends the prior Law No. 57-298, dated 11 March 1957, and--this is something absolutely new--also contains a group of standards providing basic protection for software. The first and most significant standard under Title V of the law ("on software") provides that, except for an agreement to the contrary, the software created by one or more employed workers in the performance of their jobs belongs to the employer who gets all the rights which the law gives to authors. The reproduction of the program, whose novelty character permits the implementation of the law, is forbidden; all that is permitted is the registration of a copy for the purpose of safeguarding the user's part. Any form of using a program, not expressly authorized by the author or by his rightful claimants is forbidden likewise. For this purpose, Article 48 provides for the extinction of rights after a period of 25 years from the creation of the program.

The United States: Software is protected in various ways: Patents, industrial secrecy, and copyrights. Data-processing programs, according to a 1980 law, are likened to literary works covered by copyright. The same law also provides certain deadlines. As a matter of fact, making a copy or adapting a program is not considered to be a program because:

(a) Provided this new copy or adaptation was created as an essential step in the use of the data-processing program in combination with the machine and provided it is not used in any other way, or

(b) This new copy or adaptation is used for filing purposes only and all of the filed copies are destroyed in case continued possession of the data processing program ceases to be legitimate.

In conclusion, in countries were the software protection program was examined in depth, there are two basic tendencies that emerged:

(a) Patent protection is not given to computer programs as such. In some countries, the patent is issued for inventions that include the use of a computer [data-processing machine] if the criteria of novelty and of "non-obviousness" inherent in patent legislation are complied with. Therefore, patent protection can be obtained only for the inventions that are present in a minimum part of the programs that are being made. Consequently, the patentability of computer programs is expressly excluded from the laws of many countries;

(b) In every country where the problem of copyright protection for programs was passed on to the courts, the latter were guided by the principles expressed in the Bern Convention and by the Universal Convention on Copyrights, according to which the copyright protects all works that are the fruit of the intellectual activity of the authors. Questions concerning the scope of protection did arise but there is unanimity of opinion on the fact that, in the opinion of jurists, computer programs theoretically and practically fall within the area of copyright.

CSO: 3698/631

## EUROPEAN AGREEMENT DEFINES STRUCTURE OF SYNCHROTRON PROJECT

Rome GAZZETTA UFFICIALE DELLA REPUBBLICA ITALIANA in Italian No. 171, 25 Jul 86 pp 27-29

["Text" of memorandum of understanding between Italy, France, the Federal Republic of Germany, and the United Kingdom concerning the preparation phase of the European Synchrotron Radiation project]

[Text] Ministry of Foreign Affairs

A memorandum of understanding concerning the preparation phase of the European synchrotron radiation source, which was adopted in Brussels on 10 December 1985, has come into effect among the Minister for Scientific and Technological Research of the Government of the Italian Republic, the Minister for Research and Technology of the Government of the French Republic, the Minister for Research and Technology of the Government of the Federal Republic of Germany, and the Secretary of State for Education and Science of the United Kingdom of Great Britain and Northern Ireland.

The memorandum of understanding concerning the preparation phase of the European synchrotron radiation source was signed by the Italian party on 11 March 1986.

According to Section 9, the aforementioned memorandum came into effect with the following countries on the dates indicated:

The French Republic: 11 March 1986;

The Federal Republic of Germany: 3 April 1986;

The United Kingdom of Great Britain and Northern Ireland: 8 May 1986.

Memorandum of understanding among the Minister for Scientific and Technological Research of the Government of the Italian Republic; the Minister for Research and Technology of the Government of the French Republic; the Minister for Research and Technology of the

Federal Government of the Federal Republic of Germany; the Secretary of State for Education and Science of the Government of the United Kingdom of Great Britain and Northern Ireland concerning the preparation phase of the European synchrotron radiation source.

Considering the development and the remarkable interaction of the European scientific community and with reference to the success of the previous initiatives;

Desiring to continue consolidating the position of European research within international research, to strengthen the European scientific community, and to intensify scientific cooperation beyond interdisciplinary and national limits;

Acknowledging the importance of the role that synchrotron radiation will be required to play in the study of condensed matter and in industrial applications;

On the basis of the positive experience acquired through European cooperation in neutron research;

Considering the excellent cooperation of European scientists within the European Science Foundation, as well as the proposals and considerations expressed in this field;

Looking forward to the participation of other European countries in the following activities which they intend to undertake jointly;

The Minister for Scientific and Technological Research of the Government of the Italian Republic, the Minister for Research and Technology of the Government of the French Republic, the Minister for Research and Technology of the Federal Government of the Federal Republic of Germany, and the Secretary of State for Education and Science of the Government of the United Kingdom of Great Britain and Northern Ireland, hereunder referred to as "parties," agreed to begin the preparation phase for a European synchrotron radiation source, including the appropriate centers in Grenoble, in order to continue to the construction phase in 1987, and to the utilization phase in 1993.

The present agreement is to last for a limited period, and does not prejudice the subsequent accord that must be concluded in order to regulate construction and operational procedures, and particularly the status of the European synchrotron radiation source.

The agreement seeks to define the directions necessary to begin the project promptly, and to achieve flexible and effective financial, technical, scientific, and administrative measures.

The respective governments of the parties to this agreement will be encouraged to enter into an accord concerning the construction and operation of the source, and to prepare a contract among the associates (see section 4.4), as well as the statutes concerning the establishment of the European synchrotron radiation source by June 1986, and to sign these documents by the end of 1986. In connection with the period preceding the effective dates of the aforementioned documents, which is now designated as the "preparation phase," the parties have decided:

Section 1 - Purpose of the Agreement

1.1 The combined efforts aim at preparing the construction and operation of the European synchrotron radiation source, according to the Buras & Tazzari study known as "ESRF" (European Synchrotron Radiation Facility), ESRP (European Synchrotron Radiation Project), Geneva, October 1984.

1.2 The parties will strive actively to make other European countries participate in their combined efforts.

1.3 During the preparation phase, the documents will have to be prepared taking into consideration the decisions to be adopted so that the parties and other potential participants can reach a definitive decision concerning the construction of the European synchrotron radiation source and its subsequent operation by the end of 1986.

1.4 Within this accord, it is agreed:

To complete the project definition; to establish the site of the European synchrotron radiation source in Grenoble; to proceed to the definitive estimates of construction costs and probable operational costs; to settle the rules regulating the financing of the construction and functioning of the European synchrotron radiation source; to prepare the documents concerning the decisions to be made, including the description of all the essential aspects for the realization of the European synchrotron radiation source at scientific, financial, and technical levels, and to prepare the bidding documents; to appoint a council, a general manager, a synchrotron group and a scientific advisory committee, as well as an establishment advisory committee.

Section 2 - Council

2.1 The Council supervises the work of the synchrotron group (section 4) and ensures that the present agreement is carried out in order to create the conditions required for the construction of the European synchrotron radiation source.

2.2 It is composed of representatives of the parties. Each party has a vote. Representatives of other countries interested in involvement in the project can participate as observers. The representatives of the parties will make their best efforts to take into account, to the extent possible, the suggestions of the observers.

2.3 The Council shall:

a) Appoint the general manager, and with his approval, the project manager, the experimental research manager, and other high level managers needed;

b) Settle the financial rules, and define controls and budgets;

c) Convoke committees for specific tasks as necessary, and particularly an administrative and financial committee (CAF) which may include representatives of the associates;

d) Appoint a scientific advisory committee;

e) Appoint an establishment advisory committee at the proposal of the general manager;

f) Decide on the definitive site of the European synchrotron radiation source in the district of Grenoble;

g) Decide on the definitive technical projections and the final estimates of the overall costs on the advice of the general manager;

h) Decide on any important measures to be adopted which do not fall within ordinary administration.

2.4 The decisions of the Council concerning paragraphs a) through g) of Section 2.3 must be unanimously adopted by the voters. For the other decisions, a simple majority of the representatives of the parties is required. All decisions exceeding the term of the present agreement will be submitted for approval by the future Council of the European synchrotron radia-

tion source, which must be constituted in accordance with the organizational legal instruments of the source.

2.5 The parties, acting by common consent, can adopt urgent decisions; these decisions will be the subject of a report at the next Council meeting.

Section 3 - General manager and other senior officials

3.1 The general manager and other senior officials mentioned in paragraph a) of Section 2.3 are appointed initially for the duration of the preparation stage. Throughout the present agreement, the general manager must not undertake any commitment which exceeds the term of the preparation phase unless he is authorized by the Council.

3.2 After the decision to constitute the European synchrotron radiation source has been made, the appointment of the general manager and other senior officials mentioned in paragraph a) of Section 2.3 may be extended through a 5-year contract.

3.3 The general manager is responsible to the Council for the project, both in its preparation and realization.

3.4 The general manager must submit the budget plan for the Council's approval.

3.5 He must submit to the Council at every session a progress report on the synchrotron group's work. Specifically, the report must include a list of the technical and scientific activities undertaken by the synchrotron group, and a schedule of utilization of funds.

3.6 In order to reach the aims of Section 1, the general manager is authorized to arrange all necessary contacts for the synchrotron group, or make use of existing contacts to obtain advice, organize meetings, and delegate tasks to third parties through contracts, particularly in connection with the study and development of prototypes.

Section 4 - Synchrotron Group

4.1 Members of the synchrotron group, except the members mentioned in paragraph a of Section 2.3, are appointed by the general manager, in consultation with the project manager, and with the assistance of the national bodies of the parties mentioned in Section 4.4 as well as that of the countries having

the status of observer. All members of the synchrotron group are under the authority of the general manager. The general manager must take into consideration the multinational character of the enterprise when making his choices.

4.2 The synchrotron group must prepare all documents required by the parties in order to decide on the construction of the European synchrotron light source and its further utilization. For this purpose, in particular, the project definition will be concluded and the construction and operational cost estimates will be established.

4.3 The parties will ensure that the national research boards mentioned in Section 4.4 will make available, at the proposal of the general manager, all necessary staff for the preparation phase. The corresponding costs are included in the costs mentioned in Section 7.1.

4.4 The national research boards mentioned in this agreement as associates are as follows:

For the French party: the Atomic Energy Commission (CEA); the National Center for Scientific Research (CNRS).

For the German party: the Nuclear Research Center [Kernforschungzentrum]; Karlsruhe Gmh (KFK).

For the Italian party: the National Institute of Nuclear Physics (INFN); the National Research Council (CNR).

For the United Kingdom party: the Science and Engineering Research Council (SERC).

Every new associate to the present agreement must appoint one or two national research boards.

Section 5 - Scientific Advisory Committee

5.1 A scientific advisory committee will express its opinion on all scientific and technical matters concerning the preparation of the European synchrotron radiation source, particularly with regard to the definition of the machine, related equipment, and experimental facilities.

5.2 The number of members of this committee is limited to a maximum of twenty. All involved scientific disciplines with be adequately represented. The members of this committee will be

appointed by the Council, at the proposal of the parties and the countries with observer status.

5.3 The scientific advisory committee will elect a committee president.

Section 6 - Establishment Advisory Committee

An establishment advisory committee will be created by the Council. This committee will advise the general manager concerning all important technical aspects of the installation. The members of this committee and its president are appointed by the Council, at the proposal of the general manager.

Section 7 - Financing

7.1 The preparation costs are limited to a maximum of 30 million French francs (1985 currency). The division of financial contributions is as follows:

40 percent to the French party; 30 percent to the German party; 15 percent to the Italian party; 15 percent to the United Kingdom party.

7.2 Initially, the contributions of new associates to the present agreement will bring about an equal reduction of the French and German contributions until they reach rates of 35 percent and 25 percent, respectively. Over this limit, any new participation will involve a rearrangement of the contribution sharing.

Section 8 - New Associates

The present agreement is open to other associates. The partnership conditions will be determined between the parties and the candidate parties.

Section 9 - Coming Into Force, Term, Withdrawal

The present agreement will come into force on the date it is signed by the parties and will end on 31 December 1986. Should the preparation period go beyond this date, the parties agree to extend the present agreement for renewable 6-month periods.

After 31 December 1986, a party may announce its intention to withdraw in writing. The withdrawal will be effective 3 months after notification.

Drafted in Brussels on 10 December 1985 in four copies, each drawn up in Italian, French, German, and English. In case of dispute, the French version is valid. (Signatures follow)

8604
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## GERMAN VOLKSWAGEN GROUP ACQUIRES OLIVETTI STOCK

### Announcement of Agreement

Rome TELEINFORMATICA 2000 in Italian 13 Jun 86 p 3]

[Text] Ivrea, 16 June 1986. The Olivetti stockholders' meeting cleared the way for the entry into the company of the Germany Volkswagen Group which, for more than 407 billion lire, will acquire 19.9 million shares of the Ivrea house, equal to 50 percent of the capital. THanks to this purchase, the Italian company will get 29.7 percent of the German typewriter market, 17.1 percent of the personal computer market, and 5.3 percent of the mini-computer market. During the meeting, Olivetti deputy administrator De Benedetti announced that "The Group no longer owes a single lira."

### Olivetti To Get Triumph-Adler Stock

Milan SISTEMI E AUTOMAZIONE in Italian Jun 86 pp 610-611

[Article by Mauro Massara ]

[Text] For the benefit of the few readers who might have missed the news--presented rather forcefully at the end of April by all of the mass media--we repeat here the terse official announcement put out at that time. We naturally reserve for ourselves the right to come back to this agreement the moment its specific points become clearer and the moment its consequences become more foreseeable.

The agreement provides for Volkswagen--through an increase in the capital reserved for it--to acquire about 20 million shares of common stock of Ing. C. Olivetti & C., S.p.A., equivalent to 5 percent of the company's regular capital. The price of the shares will be determined on the basis of the way the prices develop at the exchange during the period of time prior to the Olivetti stockholders' meeting scheduled for 11 June but it will at any rate be between 18,000 and 21,000 lire per share. The amount of the Volkswagen investment in Olivetti will therefore be approximately 400 billion lire.

Olivetti, in turn, will take from Volkswagen the shares of Triumph-Adler AG. As for the United States, Olivetti will take over the Triumph-Adler activities currently held by Volkswagen of American Inc. (Troy, United States). The purchase does not include the holding company Triumph-Adler North America Inc. (Hartford) and Pertec Computer Corporation (Los Angeles). As for Pertec Peripherals Corporation, the two parties adopted forms of collaboration whose details have not yet been worked out.

The agreement, which was approved by the Volkswagen board of governors, was also approved by the Olivetti board of directors.

With relation to the antitrust standards, the agreement was submitted to the appropriate government agencies (the Cartel Office in Germany and Department of Justice in the United States) and will take effect after their approval.

Olivetti and Triumph-Adler will continue to operate independently, each with its own market, working on their own lines of typewriters, personal computers, and minicomputers and through the respective distribution channels, with the support of collaboration in research and development activities and the exchange of components. This cooperation is designed to strengthen the respective product lines and the distribution on an international basis in the growing office automation market.

5058

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## CNR, SICILY PLAN ADVANCED TECHNOLOGY RESEARCH CENTER

Milan IL GIORNO in Italian 24 Jul 86 p 14

[Article: "Step Number One: Research and Technology"; first paragraph is IL GIORNO summary heading]

[Excerpts] Palermo--A program has also been submitted for the development of electronics and telecommunications: 495 billion lire over 5 years.

A broad agreement has been concluded between the CNR and [Sicilian] regional authorities in the last few months. Under the terms of this agreement, a national training center is to be created in Palermo and a large number of research programs are to be implemented. The agreement will become operational as soon as the Sicilian Assembly, which reopened for business 2 weeks ago following the 22 June elections, passes the government bill under which a total of 45 billion lire will be allocated to this initiative (with an equal amount to be provided by the CNR).

This step was followed by a second step in the same direction, which includes clear operating procedures. The new law for the "Mezzogiorno" (southern Italy) gives preference to the application of technological innovation rather than, as happened in the past, to massive investments in public works. Taking advantage of this new law, the regional authorities have submitted a program for the development of electronics and telecommunications in Sicily which requires, first, a financial outlay of 495 billion lire over 5 years; second, maintenance of the present labor force of 1,450 people; and third, the creation of 590 new jobs. The program has already been submitted to the Ministry of the Fund for the South. The program, which was drawn up by experts from companies in the Iri-Stet Group (Italtel, SGS, SIP, Selenia Spazio, Selenia Industry, Telespazio, and Italcable), was coordinated by Prof Stefano Riva Sanseverino, with the support of Prof Sergio Martellucci, president of the CNR Physics Committee, and by Mr Mascioli, an engineer employed by Stet in Rome.

The regional authorities maintain that, contrary to programs formulated in the past, this program is based on concrete foundations. To a large extent, in fact, the program intends to use the services of companies already operating in Sicily and to promote closer collaboration among Sicilian technical and scientific sectors, research centers, and industry. In this respect, the regional authorities reserve for themselves the role of promoter and coordinator of new initiatives, a role which has as its objective the development of company

productivity, the logical consequences of which will be the creation of new and specialized job opportunities requiring college or high school graduates.

In concrete terms, though, what does the program presented by the regional authorities consist of?

The program consists of a total of 19 projects. Five of these have been put forward by SIP and concern the feasibility of network infrastructures for telecommunications services to be used in the three universities in Sicily, the industrial zones, the public administration, and, finally, various applications in the sectors of tourism and agriculture. The remaining fourteen projects involve the following three areas: components for microelectronics, optoelectronics and microwaves; contracts for telecommunications and data transmission via satellite; and various areas of advanced telecommunications.

One of the proposals included in the program is Italcable's plan to make the service unit in Palermo the center of the fiber optics integrated network in the Mediterranean. Under this proposal, the unit would link, via Palermo, the countries of the Middle East with the countries of the western Mediterranean and of northern Europe and North America.

Another proposal put forward in the program involves upgrading of the group of microelectronic component industries in Catania. SGS would be responsible for the construction of a laboratory for the research and testing of new microchip "structures," as well as power integration and third generation logic circuits. The new laboratory, with a program stretching up to the end of this century, will develop products and technologies for the consolidation and maintenance of the present manufacturing structures of SGS in Catania, work which will require the services of two hundred researchers. In state-of-the-art telecommunications services, the program also provides for the creation of an observatory for surveillance of the ocean and coastline using an information gathering center for the entire Mediterranean. Ilatel, on the other hand, plans to create a new company in Sicily specializing in the testing of electronic components.

The person responsible for coordination of the work group involved in the drawing up of the program, Prof Riva Sanseverino, feels that it is important for one particular aspect to be emphasized: that collaboration between universities, industry, and research centers is fundamental to the success of the program. The contribution made by these sectors, Professor Sanseverino says, constitutes an indispensable factor in the feasibility of the program, with all the implications it inevitably will have for the development of the level of professional preparation essential for sectors characterized by such rapid development.

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## NEW DEFENSE MINISTRY-CNR RESEARCH RELATIONSHIP CRITICIZED

Rome LA REPUBBLICA in Italian 27 Jul 86 p 6

[Article by Alessandro Figa Talamanca: "The National Research Council Has Never Heard of Dr Strangelove"]

[Excerpts] In the crowded panorama of Italian politics, the fact that a framework agreement between the Defense Ministry and the National Research Council [CNR] has been finalized certainly does not seem likely to make the headlines. All the more so since the agreement is so general that it is impossible even to understand what its objective is. Maybe it is merely one of those innumerable initiatives aimed at creating an image for the CNR as an organization which is active in all sectors of the nation's life, and which is also aimed at bringing in funds. But if this were the case, then this agreement would not even be worth mentioning.

There is something disturbing buried deep inside the "vacuum" of this ostensibly pointless agreement. It is believed that for the first time since the end of World War II, the CNR may intend to carry out research work covered by military secrecy.

The first draft agreement, which was rejected by the Executive Council (the management unit of the CNR), contained an all encompassing clause which read as follows: "The CNR hereby undertakes not to divulge the results of studies or research conducted in agreement with the Ministry of Defense as part of the present agreement, nor to divulge any information or data to which it may have access as a result of this collaboration should the Ministry of Defense deem this necessary for reasons of security." A less general formulation is presently being worked out by the Minister for Research.

First, let us try to understand what the use of military secrecy is. Certainly, in the wording of the relevant clause in the agreement between the CNR and the Ministry of Defense, its use is not to protect military programs from a hypothetical enemy. The main use of secrecy is to cover up the "vacuum" or, in other words, to provide a license to carry out research which either is nonexistent or of minimal importance, and to make payments to organizations or individuals whose names can remain undisclosed.

In short, secrecy is used to ensure that research is not subject to effective checks, and that financing is not subject to administrative controls.

The CNR will not develop secret weapons in its laboratories, nor is there a hysterical Dr Strangelove concealed within the ranks of CNR researchers. No, the danger lies elsewhere. As Vittorio Zucconi explains so succinctly in his correspondence from Washington, the Strategic Defense Initiative (SDI)--which already has been given the suggestive nickname of "Star Wars" by its opponents--is seen as a neat little pile of dollars to be distributed to industry and research laboratories.

Some of this money will reach Italy as well. One could maintain that there is nothing wrong with industry and the scientific community in Italy becoming involved in high tech programs. One could also maintain that SDI research brings the world one step closer to global disarmament and to peace.

But what is worrisome about all this is that what will actually happen is that the money allocated to SDI will be used as secret funding for parties and splinter groups, with the result that government and parliamentary freedom of action in important aspects of foreign policy will be undermined. What all citizens--whatever their political affiliations--should demand is that the choices regarding the role that Italy will play in the Strategic Defense Initiative be made in broad daylight, and that every cent allocated to research be accounted for.

What scientists should demand is that secrecy should be abolished from all areas of activity of the public research structures, and that a clause similar to the one included in the contracts made by the U.S. Army and universities be adopted as a standard clause for all agreements or undertakings concerning these structures.

But why is it that the CNR, the highest representative of the scientific community in Italy, did not simply reject all secrecy clauses out of hand, preferring instead the slippery path of compromise? It would have been easy to make a hard and fast stand. According to its statute, approved very soon after World War II, the CNR "promotes, coordinates and regulates scientific research for the purposes of scientific and technical progress."

What, then, has military secrecy to do with activities that are sanctioned by a legal statute?

But recent legislation--called for, paradoxically enough, by the left--sets the stage for a CNR which has severed its links with the scientific community. In the "new version" of the CNR or, in other words, a CNR freed from the constraints of a law which, as it happens, dates back to the liberation of Italy, a place will also be found for military secrecy. In fact, it is a miracle that the present Executive Council, whose term of office ran out and was extended, did as much as it did in making a timid display of resistance.

8616
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## JAPANESE INDUSTRIAL STRATEGY IN FRANCE

Paris L'USINE NOUVELLE in French 17 Jul 86 pp 42-43

[Article by Roselyne de Clapiers: "Why Are the Japanese Betting on France?"; first paragraph is L'USINE NOUVELLE introduction]

[Text] The answer is simple: Because the European strategy of their businesses calls for it. On this point, the observations of a recent MITI [Ministry for International Trade and Industry] mission in France and an ENA [National School of Administration] student investigation in Japan coincide perfectly.

"Market" and "entrepreneurial strategy:" These are the watchwords of the Japanese when asked why they invest in France.

Tomoo Miyazaki, vice president of the Bank of Tokyo and MITI representative, who led a mission to France in June at the invitation of DATAR [Delegation for Territorial Planning and Regional Activities], observed that at the end of the mission investment conditions in France were better than he had thought, but he did not make any further commitments. "Everything depends on each firm's strategy," he repeated. The Japanese mission of about 30 businessmen (bankers and corporate managers) was no doubt favorably impressed by its French reception. It was received with great ceremony by three ministers (Edouard Balladur [Economy, Finance, and Privatization], Pierre Mehaignerie [Equipment, Housing, Regional Development, and Transport], and Michel Noir [Minister Delegate in charge of Foreign Trade]) and by regional authorities. Japanese manufacturers operating in France note that "French workers' productivity and technical skills are among the highest in Europe," and that the government's attitude toward Japanese investors has continued to improve over the past 2 or 3 years, even though investment procedures are still cumbersome. These Japanese investors also have European reasons for taking an interest in our country: The entry of Spain and Portugal into the EEC has made [France] the center of Europe," Tomoo Miyazaki added.

Japanese firms generally think of coming to France in a European perspective. Jacques Hebrard, DATAR representative in Tokyo, is aware of this as he promotes France's case for 35 Nipponese investment projects currently being examined. Moreover, during their French tour these potential investors heard their regional and urban hosts emphasize the quality of communications with neighboring countries.

These thoughts stemming from the MITI mission perfectly coincide with an analysis by 24 ENA students from the Denis Diderot class. This group, led by Christian Sautter, an eminent specialist on Japan, spent 2 weeks in Japan interviewing 15 parent companies of Japanese subsidiaries in France: Sony, Akai, Toray, Clarion, Pioneer, Canon, Sumitomo, etc. These interviews were complemented by visits to Keidanren, the Japanese CNPF [French Employers National Council], and to several French specialists.

What were their findings? First, a perceptible--and already known-- tendency of Japanese investors: "They are now tending to redirect their foreign investments toward large consumer markets" such as the United Statees and Europe to the detriment of the Asian/Pacific zone. As Tomoo Miyazaki stressed in Paris, Japanese industrial investments in France have soared since 1984. Our country has become their primary European host. However, the ENA students noticed that "French industry hardly conceals its fear of setting the fox to mind the hen house." Hence the idea of pinpointing the factors leading the Japanese to invest in France.

Two ideas are noteworthy:

-Their new foreign development strategy: They cannot continue to acquire technology in an atmosphere of conflict as reflected in the Hitachi-IBM affair and in the spate of recent research agreements between large American and Nipponese groups.

-The international context favors such an evolution: Not only does Japan command financial surpluses no longer usable at home (the appreciation of the yen accentuates this trend), but it is financially "orthodox" for a strong-currency country to invest abroad. However, for various reasons "prospects for economic growth seem to be better in the United States than in Europe." And it is more attractive to seek cooperation with American giants (General Electric, General Motors, AT&T) in order to establish dominant forces than to reinforce the competitiveness of more modest European firms (with some exceptions in aeronautics, nuclear energy, space, and medicine, where Europeans are performing well).

The ENA students assert that under these conditions Japanese firm's choice to invest in France "is the result of a number of criteria." Among these criteria, often cited but not decisive, are access to the African market and the level of assistance granted to investors.

The degree of French protectionism is "significant but remains contingent." The decisive criteria are linked to the market and to manufacturing conditions, the study asserts. "The French market is attractive for its size, its high income and consumption levels, and its degree of openness to foreign products." Examples are the success of Daiwa Seiko fishing rods, Honda lawn mowers, and Canon copiers, which all hold leading market shares.

As Tomoo Miyazaki confirmed: France's geographic location and intra-European communication networks constitute a second asset. For example: From France, Toyo-Aluminum is targeting the German and Italian markets.

Raw Materials, Know-How,...and Quality of Life

There are additional criteria such as proximity of raw materials (Ajinamoto for sugar beets in Normandy), of suppliers (e.g., Yuko with Sacilor rather than Arbed in Luzembourg, and Toyo-Aluminum with Pechiney), or of subcontractors. The wilingness to make--in some cases intensive--use of local know-how is another criterion: YKK takes advantage of the textile tradition in the Nord department to manufacture zippers; Aisin Seiki at Sophia-Antipolis benefits from research in energy conservation....

Finally, ENA students conclude that there are also more subjective criteria such as France's image (examples: Gisen for decorative panels, or Suntory for wine after its purchase of the Chateau Lagrange vineyard), or the quality of life, e.g., a school for Japanese children in Alsace.

Table 1. New Establishments in 1985

| Parent Company and Subsidiary | Japanese Share (Percent) | Partner | Activity | Employees | Site |
|---|---|---|---|---|---|
| Yamahiro<br>Yuko france | 100 | | Wood screws | 30 | Gorcy |
| Toyoda<br>HES-Toyoda | 50 | Schneider<br>Sofirind | Machine tools | 250 | Montzeron<br>Cholet |
| Honda Motor<br>Honda | 100 | | Lawn mowers | 35 | Orleans |
| Sony<br>Sony France | 100 | | Compact disk readers | 230 | Ribeauville |
| Mitsui Seiki<br>Mitsui France | 100 | | Machine tools | 30 | Bonneuil |
| Mitsui<br>Yuko France | 36 | Trefimetaux | Copper sheets | 90 | Dives-sur-Mer |
| RICOH* | 100 | | Photo-copiers | 150 | |

* Established in 1986

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## BRIEFS

STET/TELEBRAS AGREEMENT--Buenos Aires, 14 April 1986. A memorandum of understanding on cooperation in the telephone and telegraph service sector was signed by Minister of Posts and Telecommunications Gava with the Brazilian government. The agreement involves STET [Telephone Finance Corporation] and TELEBRAS [Brazilian Telecommunications, Inc.]; it is designed to achieve results through more advanced technological research. In the satellite sector, there is a possibility for an agreement between TELESPAZIO, STET, and EMBRATEL [Brazilian Telecommunications Company], something that was discussed in recent days. [Text] [Rome TELEINFORMATICA 2000 in Italian 11 Apr 86 p 4] 5058

STET-PDO-PHILIPS ACCORD FOR OPTICAL EQUIPMENT--Rome, 16 June 1986. STET, PDO (Philips and Du Pont Optical), a Dutch outfit, and Italian Philips established a joint venture in Italy for the development, production, and sale of optical equipment for the audio and data markets. The joint venture will produce compact disc-audio mostly for the Italian market and compact disc-ROM for the Italian and international markets. STET will participate to the extent of 51 percent (reserving itself the right to ask for minority shares while retaining control through a suitable syndicate), while PDO will hold 39 percent and Italian Philips will take 10 percent. The headquarters of the joint venture will be near Rome. The initial investment will be more than $25 million. Production will start in 1988, reaching an annual level of about 15 million compact disc-audio units and compact disc+ROM units by 1989. Compact disc-audio will be produced mostly in the beginning but it is expected that the quantity of disc-ROM will grow substantially. The new company's board of directors will be made up of nine members (five from STET, three from PDO, and one from Philips). In describing the agreement, Giuliano Graziosi, the STET deputy administrator, noted that the criticism leveled against Italian industry, to the effect that it concentrates mostly on "monopolies," is unfounded. That is true at least of the sectors in which STET is operating. To hold on to its position in these sectors alone, it has to make decisions much faster than during the development process of the years of the economic miracle. STET, Graziosi added, has identified a sector of strategic expansion in the area of optical technologies for memory carriers. [Text] [Rome TELEINFORMATICA 2000 in Italian 13 Jun 86 p 2] 5058

ANSALDO GOES PUBLIC--Naples, 16 June 1986. Ansaldo is also getting ready to go into business. Within a few days, as a matter of fact, it is expected that 25 percent of the capital of ANSALDO TRASPORTI will be sold; through this transaction, Ansaldo and Finmeccanica [Mechanical Engineering Finance Corporation] will get about 60 billion in new money. With 1,862 employees distributed over the three establishments in Naples, Milan, and Genoa, the company achieved a business volume of more than 250 billion and, as of 31 December, had a total of 738 billion worth of orders lined up. I was also confirmed that there may be a big order for the Neapolitan company to work on the Spanish railroad net. On the other hand, the Ansaldo Group could get into the capital of the IRI [Industrial Reconstruction Institute] Company (the Spanish IRI) which operates in the transportation field. [Text] [Rome TELEINFORMATICA 2000 in Italian 13 Jun 86 p 3] 5058

EC CONCERNS OVER JAPANESE DUMPING--Brussels, 9 June 1986. The European electronic companies are trying to find out whether some Japanese companies are engaging in "dumping" (in other words, selling at cut-rate prices) of electronic parts and magnetic discs. This fear was aroused by the fact that the Europeans consider possible a diversion of Japanese production toward the old Continent after the United States blocked the importing of Japanese "chips." [Text] [Rome TELEINFORMATICA 2000 in Italian 6 Jun 86 p 3] 5058

CSO: 3698/631

# NEW SWEDISH EXPORT CONTROLS VEX USSR, PLEASE U.S. OFFICIALS

## USSR Criticism

Stockholm NY TEKNIK in Swedish 24 Sep 86 pp 8-9

[Article by Tom von Siverts]

[Text] Moscow--"The new Swedish law on export controls over civilian high technology conflicts with your nonalignment," said Piskolov J. Vasilievich of the Soviet Foreign Trade Ministry in Moscow.

In an exclusive interview with NY TEKNIK, the Soviet Union publicly criticizes the Swedish export controls for the first time.

Sweden has given in to American pressure. At the same time, Moscow admits that the American embargo is creating problems.

"We are both disappointed and surprised that Sweden gave in to the American pressure," Piskolov J. Vasilievich said.

He is acting chief of the Western Trade Section of the Soviet Foreign Trade Ministry.

The ministry is responsible for making sure that the Soviet Union can import all necessary technology. This can be done through trade representatives and various companies that deal with the West. They sometimes pay large sums of money to businessmen in the West in order to obtain technology that, according to Western embargo regulations, may not be sold to communist countries.

The Soviet criticism is directed at the Swedish regulation that took effect on 1 June this year.

When Piskolov J. Vasilievich speaks of the "law," he is referring to this regulation, which means that it is now a crime against Swedish law to break the export regulations on high technology that are established by other countries. It is primarily the United States and its allies within the secret organization Cocom (all NATO countries except Iceland, plus Japan) that have such export regulations. The Cocom regulations are directed against the Soviet Union and the Eastern Bloc.

Sweden was the last Western European country that decided to regulate the export of civilian high technology. In recent years, other neutral countries such as Austria have established their own export controls over civilian high technology.

Now, for the first time, the Soviet Union has publicly criticized the Swedish export controls, but this is no sudden reaction.

Before the regulation took effect, the Swedish government told Soviet governmental representatives on numerous occasions how the regulation would function and the reasoning behind it.

One of these occasions was in Moscow on 14-17 April this year, during the visit of Prime Minister Ingvar Carlsson.

Another such occasion was in Stockholm on 20-23 May at a government committee meeting where Industry Minister Thage G. Peterson met with Soviet Vice Trade Minister Malkevich.

"On these occasions we were told that the law would not damage Swedish-Soviet trade relations. But we have come to a different conclusion," Piskolov J. Vasilievich.

"Even though it is said that the regulation applies only to the United States and the Cocom countries, your high technology is also affected."

Damages Swedish Export Possibilities

"As you know, half the parts in a Volvo are from other countries, so of course this law is damaging to the trade relations of our countries. That is clear. But most of all, it is damaging to the ability of your own companies to export their goods," Piskolov J. Vasilievich said as he began to read a paper that his associate, Mikhail Medvedev, pushed across the table.

Piskolov continued:

"At our meetings with Swedish governmental representatives, we also made clear our general attitude toward embargoes and laws of this type."

In brief, the Soviet attitude is that all embargoes and obstacles to trade directed against the Soviet Union are doomed to failure. The Soviet Union has always been able to develop its own technology which, according to Piskolov J. Vasilievich, is on a par with that of the West in most areas.

"I can only remind you of what Gunnar Adler-Karlsson once said: "Economic battle against the Soviet Union is unrealistic."

Conflicts With Nonalignment

"The serious aspect of the Swedish law, however, is that it conflicts with your nonalignment and your nonaligned way of thinking."

According to Piskolov J. Vasilievich Sweden, which pursues a nonaligned position during peacetime, has now broken with this position by aligning itself with the United States and its allies within Cocom.

"But this does not mean that we will be without these goods. We can obtain what we need from the West, nevertheless."

From where?

"I cannot reveal that. All I can say is that we get what we need from other countries."

From what "other countries?"

"From other neutral countries. I cannot say which ones." In addition, we can continue to trade secretly with certain Western countries," he said smiling.

At this point, his associate leaned forward to help him. They exchanged a few quick words in Russian before Piskolov J. Vasilievich continued.

"In addition, we see this embargo as a push forward. There is a Russian proverb that applies to this situation: 'The worse, the better'."

"We are being forced to develop our own technology at a faster and faster rate."

In practice, the Swedish regulation applies only to the Eastern Bloc, since it is only the United States and the West that have this technology embargo. Despite this, the official Soviet commentary against Sweden has been rather tame, so far. Why is this?

"You should ask our diplomats about that. But, of course, if this law really represented a great disadvantage to us in practice, then we would protest louder."

"There was a recent example where a large Swedish company backed out of a major order and we purchased what we needed from another European company. So, for every poison there is an antidote."

The Swedish regulation does not apply to purely Swedish technology. Nevertheless, there are many examples of Swedish companies that do not want to sell their own technology to the Soviet Union. The reason is that they do not want to have problems with the United States. How do you view this?

"We know about that, but let me stress once again with all possible severity: we are against laws such as the one that Sweden has implemented. Laws of this type show how hard the United States is pushing its policies."

"We do not want to push Sweden any harder. After all, there are so many trouble spots in the world as it is."

I was startled by the significance of this response by Piskolov J. Vasilievich. But additional questioning through the interpreter and of Piskolov J. Vasilievich himself showed that I had understood him correctly.

Do you deny outright that there has been technology smuggling through Sweden, initiated by the Soviet Union?

"I dislike the word 'smuggling.' We do not use that term here. Otherwise, I cannot comment on that question."

Has the Western technology embargo had any negative effects at all on the Soviet Union?

"In certain respects, yes."

What respects?

"I can name three types of problems:

1. There are certain delays;
2. We must turn to other countries;
3. We must cooperate with other countries in producing and developing technology."

American spokesmen who advocate the embargo say they want to hinder your technological development and make it more difficult.

You, yourself, mentioned delays as one problem you are facing. If this is the case, then could it be said that the embargo is succeeding?

"I have thought a lot about that, but I believe they have failed and that they will continue to fail in the future."

But you mentioned delays as a problem.

Once again his assistant, Mikhail Medvedev, came to the aid of Piskolov J. Vasilievich, who nodded and continued.

"When I speak of delays, I mean that our trade relations are delayed in developing--not that we are unable to obtain products."

The United States claims that, as soon as you obtain advanced dual-purpose technology, it goes immediately to your defense industry. The Soviet Union has denied this. Why would we believe you, rather than the United States?

"That is a good question, but I can just point to this book," he said, taking out a copy of the book Tekniken Som Vapen (Technology as Weapon), which is based on a series of articles in NY TEKNIK.

"There is a section in this book that deals with the so-called container affair," he said, leafing through the book along with his associate.

"We see here that the line between what is civilian and what is military technology moves back and forth, to say the least," he said, pointing to pictures of the contents of the four containers that were stopped by Swedish customs and returned to the United States.

The contents of the container were classified as war materiel, but contained civilian high technology. This was demonstrated by NY TEKNIK in issue 23, 1985.

"When it comes to our own military technology, it is based on our own expertise and our own technology," said Piskolov J. Vasilievich as he closed the book again.

Certainly you remember the Datasaab affair, do you not?

"Yes."

The United States claims that this affair was a good example of what happens when civilian high technology arrives here.

According to the American opinion, which is also shared by some Swedish officers, the Swedish air control system was used in 1979 to control your air-landing operations in Afghanistan.

"The first time I heard that I answered just as I will now. The air control system is a civilian system and is used on the Moscow-Kiev-Mineral Vody route. This means it is used for civilian air traffic," Piskolov J. Vasilievich said with emphasis.

He then declared the interview to be over, said thanks, and disappeared into the corridor, closely followed by his assistant.

## U.S. Praise

Stockholm NY TEKNIK in Swedish 24 Sep 86 pp 12-13

[Article by Mikael Holmstrom]

[Text] Washington, D.C.--It will be easier to buy computers from the United States.

Swedish companies will receive "gold cards" that will simplify the import of technology.

Sweden will be removed from the Pentagon's list of smuggler countries.

These are a few types of relief the United States government is now prepared to offer Sweden. The distrust of the United States toward Sweden following several cases of technology smuggling has now been replaced with praise.

This is the result of new Swedish controls over the export of high technology.

"Excellent! I commend the Swedish government for taking this step."

This was the response of Undersecretary Paul Freedenberg to the new Swedish export controls. He has the highest direct responsibility for American export controls on civilian high technology at the Commerce Department of the United States.

"The Swedish export controls are not the final step. But they show that the Swedish government is serious about guaranteeing that Western technology transported through Sweden will go to the correct final user." Paul Freedenberg hopes that the goal of the Swedish controls is to stop the smuggling of technology to the East.

In 1984 the United States began an offensive to make the neutral countries join the embargo. The neutral countries were discriminated against, compared to the allies of the United States, which were given a more and more favored position.

This created problems for companies in neutral Sweden, which have competitors in Denmark, Norway, West Germany, England, and Japan.

In 1984 and 1985 the United States spoke harshly of Sweden. Now it is more friendly. Sweden's new export controls have changed the situation.

"Now Swedish companies will have quick and fair access to Western technology. They will not be discriminated against, in favor of their competitors," Paul Freedenberg said.

First Form Of Relief

According to him, the United States is now considering giving Sweden a more favored states. In June the first neutral country, Switzerland, was "upgraded."

"The next logical step would be to upgrade Sweden. This is now under consideration," Paul Freedenberg said.

Such a change would be contingent on this country's ability to "show that it can safeguard the further export of American goods," as the American export regulations state.

In plain language, Paul Freedenberg's statement means, among other things, that it will be easier for Swedish companies to import computers. This first form of relief could come in late 1986 or early 1987.

On 27 June of this year Paul Freedenberg visited Stockholm, among other things, for talks with the Swedish government. At present, the United States

is planning to introduce a "gold card" for major companies. They will then be able to purchase goods directly, without prior approval. This means that the companies can obtain technology faster and it will be simpler to send them to their subsidiaries in various countries.

Second Form Of Relief

This has concerned Swedish companies such as Ericsson, however. The reason is that, so far, the gold card has been intended only for companies in the United States or in the allies of the United States in Cocom (NATO countries and Japan). Thus, the Swedish companies would remain outside the "gold card club." But here, the United States is prepared to offer a second form of relief to Sweden.

"I have told representatives of the Swedish government that 'since Sweden is a cooperating country with its own system of export controls, we are considering giving gold card status to companies in Sweden, as well.' We hope to do this by the end of the year," Paul Freedenberg said, mentioning the Swedish company Asea.

In June he personally approved fines against Asea for selling computers to the Soviet Union and Czechoslovakia, in conflict with the export conditions of the United States.

"They paid their fines. I visited Asea when I was in Sweden and they have changed their internal control system. I am impressed and satisfied with what they have done."

"It can be valuable for a company such as Asea to have a gold card when it wishes to purchase equipment for the production of semiconductors. It would then be able to purchase directly, without prior approval," said Paul Freedenberg, who praised Swedish industry.

"Companies such as Asea and Ericsson manufacture products that are sold throughout the world. I am happy that they have good internal control systems so that Western technology will not 'leak' to the East," Paul Freedenberg said.

The United States still wants Sweden to implement regulations for technology that is totally Swedish, but the Swedish government has balked.

"We would really appreciate it if the Swedish government decided that it was in its own best interest to control its own technology, to guarantee that it does not fall into the hands of the Soviets. But this is not something we are pressuring the Swedish government to do," Paul Freedenberg said.

A number of highly placed sources in Washington have told NY TEKNIK that Sweden will never be placed on a par with the Cocom countries as long as we do not control the export of purely Swedish technology.

Third Form Of Relief

Swedish trade with other countries is followed closely by the Defense Department and the Pentagon. Sweden is one of the 15 countries on the Pentagon's list of "risky countries," where smuggling occurs.

Even at the Pentagon there seems to be a change in attitude toward Sweden. The person responsible for the Pentagon's export controls is undersecretary Stephen D. Bryen. As recently as 1985 he stated the following about Sweden's being on the list:

"It is better for you to be on the list."

Today that same Stephen Bryen says:

"If Sweden was on such a list--the contents of which are secret--then I would personally recommend that Sweden be removed from the list. I would have done that recently, in connection with the implementation of the new Swedish law," Stephen Bryen said.

The removal of Sweden from the "risk list" by the Pentagon is the third form of relief. Companies will notice a difference this fall, in the form of quicker export licenses for advanced technology, as soon as the Pentagon's decision is approved by the State Department and the Commerce Department.

The Pentagon also influences important export deals with Sweden involving military technology. Distrust by the United States after the Datasaab affair delayed weapons purchases from the United States to the Swedish military. Now Stephen Bryen says:

"It is in Sweden's own interest to have effective export controls. We now have an extremely positive form of cooperation with you. This makes it possible to share much military technology with Sweden."

Sweden Gradually Gave In

During the past 4 years, Sweden has tried to accommodate more and more strict demands for effective export controls. The demands have come from the United States and its allies. Sweden has adapted and implemented tougher controls--in order not to be cut off from Western technology.

New Swedish export controls have been in effect since 1 June--to the delight of the United States and to the disappointment of the Soviet Union.

The Swedish controls came into being step by step in the following manner.

1. Secret controls. The first controls were introduced secretly in May, 1982. Advanced American computers were placed under closer watch by the Defense Materiel Command (FMV). Without a certificate of protection from FMV, the

United States prohibited the exports. This control was a Swedish response to American distrust after the Datasaab affair. The semistate-owned company violated the American export conditions and delivered an air traffic control system to the Soviet Union. This same affair would delay military robot purchases for the Viggen for 5 years.

2. The South Africa law. In November 1983 four containers were found with computer equipment in Helsingborg, en route to the Soviet Union. The United States demanded that they be stopped and the government came up with a law that prohibited war materiel from South Africa, from which the containers had come. The contents were classified as war materiel and sent to the United States, which praised Sweden. Later, however, NY TEKNIK discovered that there had been no war materiel in the containers.

3. On Pentagon's list. Swedish customs officials began hunting technology smugglers after the government declared, during the container affair, that Sweden could not be a transit country.

In March 1984, however, the Pentagon placed Sweden on its list of "risky countries."

Sweden then became one of the Western countries that the United States watched most closely. This meant even longer waits before Sweden was able to obtain export permits from Washington.

4. Pressure on Sweden. In 1984 Cocom held an important meeting in Paris. These countries agreed in secret to mount a diplomatic offensive against neutral countries such as Sweden, in order to make them back the Western technology against the East. Cocom consists of NATO plus Japan.

5. Swedish companies increase their controls. Stiff fines against Datasaab (32.5 million in April 1984) and Asea (3 million kronor in June 1986) showed that the United States really meant business. Asea was fined for the illegal export of computers to the Soviet Union and Czechoslovakia. Hundreds of Swedish companies responded by undergoing training and introducing their own control systems.

6. United States offensive. Three undersecretaries from the Commerce, State, and Defense Departments made it clear that Sweden must have export regulations for high technology. This was indicated in February 1985 in a series on export controls in NY TEKNIK. But Swedish undersecretary Carl-Johan Aberg maintained that this was not a genuine issue. The export conditions of the United States were basically a question for the individual companies, not for the government. Sweden was not discriminated against or pressured by the United States, according to Carl-Johan Aberg.

7. Customs powerless. Export control groups from the Customs Authority showed that crimes against export regulations of the United States could not be stopped with existing Swedish laws. In the fall of 1985 West Germany and the United States demanded that a computer shipment to East Germany be stopped. The government was totally powerless on that occasion, however,

and in December an American delegation arrived in Stockholm to demand effective Swedish export controls.

8. Swedish export controls introduced. The decision was made by the government on 27 February 1986. Parliament was informed after the fact. The purpose was to stop technology smuggling--and to increase Sweden's access to foreign high technology. The government regulation did not mention any countries by name, but when the customs regulations came out in May, it was clear that the controls were directed, in practice, against the East.

9. United States moves Sweden. The NY TEKNIK illustration [illustration not shown] shows how the United States catagorizes the countries of the world for export regulations. The controls are directed against the East, groups 8-13. The fact that Sweden has now been moved from group 6 to group 3b means that Swedish companies can obtain more advanced technology and obtain it quicker and easier. This is the first form of relief for Sweden.

Group 3b will contain the neutral countries that have effective export controls, but are not members of Cocom (groups 1-3).

As indicated by interviews reported in these articles, Sweden is now being praised by the United States. Moscow, on the other hand, believes that the Swedish export controls conflict with Sweden's nonalignment (see last week's issue of NY TEKNIK.

## Technology As Weapon, Book Review

Stockholm NY TEKNIK in Swedish 24 Sep 86 p 14

[Article by Peter Berlin]

[Text] Tekniken som vapen (Technology as Weapon), Mikael Holmstrom and Tom von Sivers, NY TEKNIK/Ingenjorsforlaget, 1985, 176 pages, illustrations, approximately 180 kronor.

There is good news for those who have followed the NY TEKNIK series of articles on American export controls over advanced technology. The material has now been compiled in book form, after being edited and supplemented.

The United States has taken of the gloves and placed Sweden against the wall. American law rules in our country with much greater effectiveness than when we ourselves read the law to the Americans during the Vietnam War. Swedish companies pay millions in fines to the United States government, while the Swedish government yields to the superior force or pretends that nothing is happening.

This is not the main theme of the book, but the reader senses a certain suppressed indignation on the part of the authors when they describe Sweden's technological dependence on the United States, the American bureaucracy,

uncertainty as to whether or not the Commerce Department of the United States will grant export permits for basically Swedish technology, raids by the export police, and the indifference and impotence of the Swedish authorities.

Perhaps what is missing in the book is a psychological background to the American strangle-hold on technological exports from "friendly" countries. After the book was published, there was much publicity surrounding the "Farewell" document that fell into the hands of the French government and revealed the almost unbelievable determination of the Russians to smuggle advanced technology from the West. On 5 April 1983 the Soviet charge d'affaires in Paris was called to the French Foreign Ministry and presented with internal Soviet documents on systematic industrial espionage. He is reported to have turned red and changed colors like a traffic light before being asked to send home immediately 47 employees at the Russian embassy. As a result of the French revelations, an additional 94 Soviet diplomats were sent home from other Western capitals. Nevertheless, this was only the beginning of a long series of discoveries involving industrial espionage and technology smuggling that are illegal by any judicial standard. Considering the virtually total dependence of the Western countries on advanced technology from the United States, it was perhaps not totally surprising that the Americans finally invoked export laws that have been in existence since World War II.

The book is written in short, terse sentences with continued repetition, in order to spare the reader from having to think too much. Nevertheless, it provides food for thought for people who deal with American hardware and software in the Swedish economy, which is so dependent on exports. Technology as Weapon should be bought by all businessmen who have even an ounce of instinct for self-preservation.

9336
CSO:3698/656

# MICROCOMPUTER TECHNOLOGY USED IN BULGARIAN PLANT

Sofia VECHERNI NOVINI in Bulgarian 1 Aug 86 p 1

[Article by Rumyana Kochanova: "Automatic Machine Lays out Patterns and Cuts Metal"]

[Text] Computer equipment is introduced at the Khristo Smirnenski plant in Sofia. High output and precision are achieved in parts production.

Rationalization proposal 5

Project: automation of production processes in oxyacetylene cutting of sheet metal through a computer network with digital program control, along with modification of three Griesheim machines.

Project group: Engineers Iliya Simidchiev, Institute of Construction Machinery, Manipulators, and Robots, Sofia, and docent Emil Rats, Angel Kunchev Higher Technical School, Ruse, directors.

Organization applying project: Khristo Smirnenski Crane Building Plant, Ruse.

Any person who has merely watched the processes of oxyacetylene cutting of sheet metal can appreciate the social and economic impact of the project currently being applied at the Khristo Smirnenski plant in Sofia. It eliminates the unappealing manual labor performed under difficult conditions in an unhealthy atmosphere, increases labor productivity by a factor of 3 to 4, and improves the accuracy of workpiece production by a factor of 4 to 6. Many supplementary operations are eliminated, and materials and energy are conserved.

We could add to the list of benefits provided by automation of the processes of oxyacetylene cutting of sheet metal developed by specialists of the Institute of Construction Machines, Manipulators, and Robots in Sofia, in cooperation with their colleagues at the Angel Kunchev Higher Technical School in Ruse. But first we should explain the technological changes that are taking place.

As we have said, the machines currently used in Bulgaria for operations of this kind in machinebuilding are manually controlled. Speed and accuracy of execution depend on the worker and on his experience and attentiveness.

Following a ready-made template, the person operating the machine must constantly watch and vary the height of the burner, move the sheet of metal, and measure the cuts made. There are a large number of operations, which make the productivity of the work low.

A significant technological advance is achieved by modifying the three existing Griesheim machines at the plant and by instituting digital program control for them.

"This in effect is the most modern application anywhere in the world in the area of automation of oxyacetylene cutting of sheet metal. Machines with digital program control are manufactured exclusively by a few companies in the West and are marketed at high prices," says engineer Krustyu Kunev, head of the technologies and standardization base division of the institute. "Some time ago the plant proposed to the company producing our machines that these machines be automated, but the proposal was rejected. The problem was then turned over to the specialists of the institute."

The worker is transformed essentially into a supervisor who watches to make certain that the program is carried out properly. The machine itself heats the metal to the required temperature, cuts along the outline drawn in the machine's memory, and speeds to the next position. The program can be entered manually, by pressing keys or by running a punched tape. All the operations are controlled by a central processor, which transmits its commands by means of sensors. The device can remember up to 16 programs, depending on their complexity. Burner height is maintained automatically, with resulting optimum consumption of energy sources. Cutting is accurate within a mere 0.5 millimeter. The machines are outfitted with monitors, on which the operator observes the entire process.

Introduction of automation of the three oxyacetylene cutting machines at the plant is proceeding smoothly. The first of the machines will begin operation any day now. Electronic and mechanical elements for the other two machines are in production. These two machines should be in operation by the end of the year. Production is being paralleled by training of personnel, for whose skills the upgraded equipment sets more rigorous requirements. The persons who are to write the programs and learn the programming language thoroughly are also being trained.

The three machines will eventually form a production line. This will contribute to even higher concentration of processes and increase in cutting speed, optimum use of materials, and lowering of production waste to the minimum. The aim is to use the potential of the equipment to the full. However, there is also a long-term goal for the project. All machines for oxyacetylene cutting of sheet metal can be modified according to the principle involved, and there are more than 300 such machines in the system of the Investmash economic organization.

6115
CSO: 2202/330

# BULGARIAN ELECTRONICS INSTITUTE HEAD CITES NEW DEVELOPMENTS

Sofia VECHERNI NOVINI in Bulgarian 1 Aug 86 p 4

[Article by Dr Aleksandur Ya. Spasov, director of the Institute of Electronics under the Bulgarian Academy of Sciences: "Electronics Expands its Territory"]

[Text] Technology and equipment for synthesis of new materials--Equipment installed for electron beam welding and melting platinum--Internationally recognized results--Need for modernizing resources

The contemporary scientific and technical revolution is above all a technological revolution. Corpuscular-photon (electron-beam and ion-beam, vacuum, plasma, and laser) technologies are prominent among the leading edge technologies.

The physical processes associated with these technologies and with technological equipment, simulation, control and optimization of the processes, and problems of their application are studied at the Institute of Electronics under the Bulgarian Academy of Sciences. Only a few of the scientific results and applications will be discussed here.

A study of the interaction of ion beams with crystals conducted in collaboration with the universities of Moscow and Salford (England) has revealed new phenomena, semichanneling and hyperchanneling of ions in the crystal lattice of a bombarded target. These phenomena are of importance both in determination of the mechanisms of interaction and in specific applications of ion beam technologies.

Study of gas sorption on metal surfaces has revealed a new effect, ion stimulated sorption, consisting of multiplication of sorption capacity on metal surfaces. A technology has been developed on this basis for the synthesis of new materials, compounds of the metal-metalloid type with a new structure and properties and with a variety of potential applications.

Study of the physical processes taking place in electron and ion lithography, a technology of strategic importance to microelectronics, has led to discovery of a new effect, increase in modification or erosion of polymers accompanied by growing elastic losses of penetrating ions, and a new approach has been evolved on this basis.

The institute has developed and is producing small batches of heterosublimation pumps and stands for a clean (oil-free) superhigh vacuum for research and technological systems, laser devices for cutting glass components, and laser systems for medical-biological, technological, and other research. The personnel of the institute have developed ion technology and process equipment for applying wear-resistant heads for recording and reading information, coating conductors and wires, and a technology and equipment for application of coatings and producing finely dispersed powder and materials. Electron beam technology and equipment have been introduced for electron beam melting of platinum.

We are also pursuing development of such promising areas as cryoelectronics (low-temperature electronics) and the superconductivity applications and interesting phenomena associated with it, and molecular electronics and bioelectronics. We are devising new methods, technologies, and measuring equipment for data processing and transmission (fiber optics systems, satellite television and space communications systems).

Microwave and laser methods for exploring and studying the atmosphere and the surface of the earth and the seas, remote sounding methods, are powerful tools in modern meteorology, ecology, and remote study and monitoring of the state of biological resources. The results obtained at the institute in laser and microwave sounding permit remote measurement of the aerosol content of the atmosphere, its temperature, humidity, transparencey, the boundaries and speed of cloud fields, the concentration of gaseous pollutants, the state of water surfaces, the moisture content and condition of soils, and the thickness of the snow mantle. The laser and microwave systems developed at the institute (lidars and radiometers) for stationary and mobile platforms can be an integral part of the national system for express measurement and monitoring of these parameters for the needs of meteorology, agriculture and forestry, and ecology.

The caliber of the scientific results achieved by the institute can be gauged by national and international recognition, as demonstrated by the prizes awarded by the Academy of Sciences of the USSR and the Bulgarian Academy of Sciences to the Institute of Electronics and the Institute of Optics of the Siberian division of the Academy of Sciences of the USSR for research on laser sounding of the atmosphere, the Academy of Sciences of Poland and the Bulgarian Academy of Sciences for investigation and study of surfaces and for development of superhigh vacuum systems and vacuum technologies, and the 1985 award presented in the national "research and application" competition for development and application of electron beam technologies.

These scientific results, and especially scientific applications, would have been even more significant if the experimental resources of the institute had been reinforced and renovated. The strengthening and expanding the design, technological, and auxiliary elements of the institute should also be strengthened and expanded. This would considerably speed up application of our scientific results. The experience we have gained in crossing the no man's land between scientific developments and wide application of these developments justifies our anticipation of such reinforcement and renovation. At the same time, it is to be noted that the necessary support will also be given to the Intersectoral Laboratory on Electron Beam Technology, a successful form of combined academic and industrial science and production

activities the results of which have met with approval in all quarters. The institute has a number of projects which if given minimum support would lead to new technological solutions, equipment, and materials which are urgently needed by the country and for which precious foreign exchange is now spent.

6115
CSO: 2202/32

# BULGARIAN ELECTRONIC PLANTS DESIGNATED AS LEGAL PERSONS

Sofia DURZHAVEN VESTNIK in Bulgarian 12 Aug 86 pp 18-21

[Order No. 1265, dated 29 April 1986, of Izot Economic Trust (chairman: Iv. Tenev), designating units of the trust as legal persons]

[Text] On the basis of article 5, paragraph 1 of Order No 6/1986 of the Bureau of the Council of Ministers and Decision No. 2, dated 29 April 1986, of the economic council of the trust, the following are established (reestablished) as individual juridical persons operating with an independent balance sheet and bank account, effective as of 1 July 1986:

I. Under Izot Combine--information systems--Sofia:

1. Computer Equipment Plant--Sofia, the object of whose activity is the production and sale of information systems and subsystems based on large electronic computers. It shall be established on the basis of the existing plant with the same name.

2. Electronics Plant--Sofia, the object of whose activity is the production and sale of information systems based on minielectronic computers and special computing systems. It shall be established on the basis of the existing plant with the same name.

3. Printed Circuits Plant--Sofia, the object of whose activity is the production of bare and installed printed circuit boards. It shall be established on the basis of the printed-circuit-board sections in the ZIT [Computer Equipment Plant]--Sofia and the Electronics Plant--Sofia.

II. Under Izot Combine--disk storages and magnetic carriers--Stara Zagora:

1. Large Subsystems Plant--Stara Zagora, the object of whose activity is development-and-application, production, marketing-and-supply and trading activity in the area of disk storages and subsystems for ES and SM computers. It shall be established on the basis of the existing Mechanical Plant and ZZU [Zavod za zapametyavashti ustroystva; Storage Plant]--Stara Zagora, affiliated with OZZU [Obedineni Zavodi za Zapametyavashti Ustroystva; United Storage Plants]--Stara Zagora.

2. Small Subsystems Plant--Stara Zagora, the object of whose activity is development-and applications, production, marketing-and-supply and trading activity in the area of micro-VZUMD's [magnetic-disk external storages], subsystems for personal and professional computers, and special production. It shall be established on the basis of the existing Mechanical Plant and Workshop of Plant No. 6 in the OZZU--Stara Zagora.

3. Information Carrier Plant--Stara Zagora, the object of whose activity is development, applications, marketing-and-supply and trading activity in the area of information carriers and magnetic heads for VZUMD's. It shall be established on the basis of the existing plant with the name of Plant No. 6 in the OZZU--Stara Zagora.

4. Flexible Magnetic Disk Plant--Chirpan, the object of whose activity is development-and-applications, production, marketing-and supply and trading activity in the area of flexible magnetic-disk storages. It shall be established on the basis of the existing Chirpan Flexible Magnetic-Disk Storage Plant in the OZZU--Stara Zagora.

5. Instrument and Nonstandard Equipment Plant--Stara Zagora, the object of whose activity is development-and-applications, marketing-and-supply and trading activity in the area of instrumentation, nonstandard equipment, modular machines and lines. It shall be established on the basis of the existing plant with the same name in the OZZU--Zagora.

6. Technological Equipment Plant--Stara Zagora, the object of whose activity is development-and-applications, marketing-and-supply and trading activity in the area of unique electronic, electromechanical and optical equipment, vacuum systems, measuring equipment and other products. A newly established plant.

7. Scientific Production Enterprise for Control Devices--Stara Zagora, the object of whose activity is scientific-research, designing, development-and-applications, marketing-and-supply and trading activity in controls for robots and manipulators, TsPU [digital program controls] for metalworking machinery and other control systems. It shall be established on the basis of the existing enterprise by the same name in the OZZU--Stara Zagora.

8. Electromechanical and Electronic Products Plant--Smolyan, the object of whose activity is development-and-applications, production, marketing-and-supply and trading activity in the area of flexible magnetic-disk storages, blocks and other electronic measuring equipment. It shall be established on the basis of the existing plant by the same name in the OZZU--Stara Zagora.

9. Chemicals and Magnetic Powder Plant--Gorna Oryakhovitsa, the object of whose activity is production, marketing-and-supply and trading activity in the area of magnetic materials. It shall be established on the basis of the existing Chemicals Plant in Gorna Oryakhovitsa.

10. Tester Equipment Plant--Muglizh, the object of whose activity is development, applications, production, marketing-and-supply and trading activity in the area of specialized repair-and-technological equipment. It shall be

established on the basis of the existing Special Technological Equipment Plant in Muglizh, in the OZZU--Stara Zagora.

11. The Razlog Magnetic Head Plant with BRV [not further identified; possibly Baza za razvitie i vnedryavane, development and applications facilities], the object of whose activity is development-and-applications, production, marketing-and-supply and trading activity in the area of magnetic heads. It shall be established on the basis of the existing plant with the same name.

12. The Pazardzhik Data Carrier Plant, the object of whose activity is scientific-research, development-and-applications, production, marketing-and-supply and trading activity in the area of data carriers. It shall be established on the basis of the existing Magnetic Disk Plant in Pazardzhik.

13. The Byala Printed Circuits Plant, the object of whose activity is development-and-applications, production, marketing-and-supply and trading activity in the area of printed circuit boards and other electronic equipment. It shall be established on the basis of the existing Printed-Circuit-Board Installation Plant--Byala, in the OZZUTO [not further identified; possibly Obedineni zavodi za zapametyavashti ustroystva i tekhnologichno oborudvane, United Storage and Technological Equipment Plants]--Ruse.

14. Computer Center--Stara Zagora, the object of whose activity is the development and applications of data systems and engineering activity using computer technology. Performance of specialized package services. Coordination of activity in automation of data services and operation with software in the combine. It shall be established on the basis of the existing computer center in Stara Zagora, in the OZZU--Stara Zagora.

15. The Social-Welfare-Complex Enterprise--Stara Zagora, the object of whose activity is relief services, public food service, public health service, vacation facilities, housing, cultural activity and recreation of workers, personnel training (PUTs [vocational training centers]), and the like. It shall be established on the basis of various activities of a social and domestic character in the OZZU--Stara Zagora.

III. Under Izot Combine--electronic equipment and tape storages--Plovdiv.

Electronic Equipment and Tape Storage Enterprise--Plovdiv, the object of whose activity is the production of magnetic-tape (large, mini- and micro-) storages, tape subsystems, special technological equipment and other electronic equipment. It shall be established on the basis of the existing United Storage Plants--Plovdiv.

IV. Under Tekhnotronika [Technotronics] Combine--Sofia:

1. Technological Electronics Plant--Sofia, the object of whose activity is the production of electronic control devices and marketing-and-trading activity in digital program devices. It shall be established on the basis of the Elektra Plant and the NPP [Scientific Production Enterprise] for EUU [Elektronnoupravlyavashti ustroystva; electronic controls] in Sofia.

2. Service Enterprise for Electronic Controls--Sofia, the object of whose activity is repair and maintenance of electronic control devices, with service facilities in Stara Zagora, Lovech, Ruse, Plovdiv, Vratsa, Burgas and Varna. It shall be established on the basis of the production unit with the same name.

V. Under Izot Combine--systems and teleprocessing--Veliko Turnovo:

1. Teleprocessing Systems Plant--Veliko Turnovo, the object of whose activity is the production, installation and sale of teleprocessing systems and local networks and associated engineering activity. It shall be established on the basis of the ZZU [Storage Plant[ workshops in Veliko Turnovo.

2. Electronic Devices Plant--Svishtov, the object of whose activity is the production and sale of power supply units and other assemblies associated with this activity. It shall be established on the basis of the power-supply-unit and keyboard workshop in Svishtov, affiliated with the Veliko Turnovo ZZU.

3. First-of-May Plant for Mechanical Parts and Special Technological Equipment in Polski Trumbesh, the object of whose activity is the production of mechanical designs, technological equipment and other machines. It shall be established on the basis of the existing First-of-May Plant in Polski Trumbesh.

4. Terminals Plant--Veliko Turnovo, the object of whose activity is the production of printed-circuit boards, monitors, linear quantizers and local networks. It shall be established on the basis of the linear-quantizer, tester and [printed-circuit] board workshops in the Veliko Turnovo ZZU.

VI. Under Mekhatronika [Mechatronics] Combine--Gabrovo:

1. Console and Keyboard Plant--Gabrovo, the object of whose activity is the production and sale of consoles and keyboard. It shall be established on the basis of the ZPU [not further identified; possibly Zavod za pultove na upravlenie, Control Console Plant]--Gabrovo, in the Mekhatronika Combine--Gabrovo.

2. Technological Equipment Plant--Gabrovo, the object of whose activity is the production and sale of special technological equipment for microelectronics and machine building. It shall be established on the basis of the Industrial Electronics Plant--Gabrovo, in the Mekhatronika Combine--Gabrovo.

3. Weak-Current Transformer Plant--village of Sokolovo (Gabrovo Okrug), the object of whose activity is the production and sale of weak-current transformers. It shall be established on the basis of the existing plant by the same name in the Mekhatronika Combine--Gabrovo.

4. Graphic Peripheral Devices Plant--Gabrovo, the object of whose activity is the production and sale of plotters, digitizers and sensors. It shall be established on the basis of existing production units by the same name.

5. Mekhatronika Institute--Gabrovo, the object of whose activity is the development of documentation for the SAPR [not further identified] specialization, special technological equipment and weak-current transformers. It shall be established on the basis of the existing institute by the same name.

VII. Under the Izotserviz [Computer Equipment and Office Machinery Service] Combine--Sofia:

1. Izotserviz Service Enterprise--Sofia, the object of whose activity is the maintenance and repair of computer equipment and office machinery. It shall be established on the basis of Izotserviz's branch in Sofia.

2. Izotserviz Service Enterprise--Plovdiv, the object of whose activity is the maintenance and repair of computer equipment and office machinery. It shall be established on the basis of Izotserviz's branch in Plovdiv.

3. Izotserviz Service Enterprise--Varna, the object of whose activity is the maintenance and repair of computer equipment and office machinery. It shall be established on the basis of Izotserviz's branch in Varna.

4. Izotserviz Service Enterprise--Ruse, the object of whose activity is the maintenance and repair of computer equipment and office machinery. It shall be established on the basis of Izotserviz's service facilities in Ruse.

5. Izotserviz Service Enterprise--Stara Zagora, the object of whose activity is the maintenance and repair of computer equipment and office machinery. It shall be established on the basis of Izotserviz's branch in Stara Zagora.

6. Izotserviz Service Enterprise in Pleven, the object of whose activity is the maintenance and repair of computer equipment and office machinery. It shall be established on the basis of Izotserviz's service facilities in Pleven.

7. Izotserviz Service Enterprise--Burgas, the object of whose activity is the maintenance and repair of computer equipment and office machinery. It shall be established on the basis of Izotserviz's service facilities in Burgas.

8. Izotserviz Service Enterprise--Veliko Turnovo, the object of whose activity is the maintenance and repair of computer equipment and office machinery. It shall be established on the basis of Izotserviz's service facilities in Veliko Turnovo.

9. Izotserviz United Service Economic Units--Sofia, the object of whose activity is the maintenance and repair of computer equipment and office machinery. It shall be established on the basis of service facilities not included in the structure of the newly established enterprises.

VIII. Under Izot Combine--systems and electronic equipment--Ruse:

1. Metallized Printed-Circuit Board Plant--Ruse, the object of whose activity is the production of two-layer and multilayer printed-circuit boards and the sale of output. It shall be established on the basis of the existing Plant for the production of Two-Layer and Multilayer Printed-Circuit Boards with Metallized Openings--in Ruse OZPPTO [not further identified; possibly Obedineni Zavodi za Pechatni Platki i Tekhnologichno Oborudvane, United Printed-Circuit Board and Technological Equipment Plants].

2. Installed Printed-Circuit Board Plant--Ruse, the object of whose activity is the installation of large-series printed-circuit boards and the sale of output. It shall be established on the basis of the existing plant of the same name in OZPPTO--Ruse.

3. Plant for Technological Equipment and Electronic Systems for Testing of Printed-Circuit Boards and for Design Automation--Ruse, the object of whose activity is the production and sale of tester systems for printed-circuit boards and electronic systems. It shall be established on the basis of the existing Tester Equipment Plant--Ruse, in OZPPTO--Ruse.

4. Instrument and Nonstandard Equipment Plant--Ruse, the object of whose activity is the production of instrumentation for printed-circuit boards and nonstandard technological equipment for the combine's needs. It shall be established on the basis of the existing segregated production process in the OZPPTO--Ruse.

IX. Under Orgatekhnika [Office Machinery] Combine--Silistra:

1. Computer and Electronic Equipment Plant--Silistra, the object of which is the production of printed-circuit boards, electronic cash registers, electronic calculators, microprocessor systems, special electronic products, etc. It shall be established on the basis of the existing Printed-Circuit Board Plant, Computer Equipment Plant and Electronic Equipment Plant in the Orgatekhnika Combine--Silistra.

2. Special Technological Equipment Plant--Silistra, the object of whose activity is the production of instrumentation and nonstandard equipment. It shall be established on the basis of the instrument workshop and the nonstandard equipment workshop in the Orgatekhnika Combine--Silistra.

3. Engineering Enterprise--Silistra, the object of whose activity is the study, designing, procurement and delivery of equipment, including development and introduction of programmed products, installation jobs involving the reconstruction, modernization and bringing on stream of production capacities, the expansion of the capabilities of microprocessor systems, other functions in the research-and-applications process and associated investment activity in the country and abroad. It shall be established on the basis of the existing enterprise with the same name.

X. Enterprises and Institutes of Which the Trust Consists:

1. Instrumentation and Electronic Equipment Plant with BRV [not further identified; possibly Baza za razvitie i vnedryavane, Development and Applications Facilities]--Shumen, the object of whose activity is engineering-and-applications and production-and-trading activity in the area of instrumentation, electronic and special technological equipment. It shall be established on the basis of the existing Instrumentation and Nonstandard Equipment Plant in Shumen with BRV.

2. Recording and Electronic Equipment Plant with BRV--Samokov, the object of whose activity is engineering-and-applications, production-and-trading activity

in the area of recording and technological equipment. It shall be established on the basis of the existing recording equipment plant in Samokov with BRV.

3. Mechanical Design and Electronic Equipment Plant with BRV--Blagoevgrad, the object of whose activity is engineering-and-applications, production, marketing-and-supply and trading activity in the area of mechanical designs, technological and electronic equipment. It shall be established on the basis of the existing Mechanical Design Plant in Blagoevgrad, with BRV.

4. The Prof Kr. Dobrev Electronic Power-Supply Units and Structural Elements Plant--Kharmanli, the object of whose activity is production-and-trading activity in the area of electronic power supply units and structural elements. It shall be established on the basis of the existing Prof Kr Dobrev Low-Voltage Apparatus Plant--Kharmanli.

5. Izotstroykomplekt [Izot Construction Package] Engineering Enterprise--Sofia, the object of whose activity is the study, bidding, contracting, planning, designing, delivery, installation, and rendering of advice and assistance in installation, and building of plants, enterprises, workshops, automated flow lines and systems in the area of computer equipment and office machinery within the country and abroad and the investor control necessary for these. It shall be established on the basis of the existing enterprise by the same name.

6. TsIITT [Tsentralen Institut za Izchislitelna Tekhnika i Tekhnologii; Central Computer-Equipment and Technologies Institute]--Sofia, the object of whose activity is scientific-research and planning-and-design activity in the area of computer equipment and office machinery. It shall be established on the basis of the existing Central Computer-Equipment Institute--Sofia, plus the existing branch in Varna and the newly created branch on the basis of BRV of Orgatekhnika Combine--Silistra.

The enterprises here established (reestablished) shall assume the assets and liabilities on the balance sheet by 1 July 1986 and the other rights and obligations of the enterprises (production units) on the basis of which they are reestablished (established), or which are included in their structure.

The order has been coordinated with the Executive Committee of SNS [Sofia People's Council] and with the Executive Committee of the okrug people's councils concerned and is published with the authorization of Economic Council of the Council of Ministers.

For the chairman: Iv. Tenev.

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